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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,502	04/04/2005	Andrew Robert Harvey	04-850	4201
20306 7590 04/02/2009 MCDONNELL BOEHNEN HULBERT & BERGHOFF LLP 300 S. WACKER DRIVE 32ND FLOOR CHICAGO, IL 60606				
EXAMINER GEISEL, KARA E				
ART UNIT		PAPER NUMBER		
2877				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/511,502

**Applicant(s)**

HARVEY ET AL.

**Examiner**

KARA E. GEISEL

**Art Unit**

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 January 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 and 7-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7 and 9-20 is/are rejected.
- 7) ☒ Claim(s) 8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's amendment, filed January 12th, 2009, has overcome the rejections based on Law (USPN 3,497,283) and Schindler (US Pubs 2002/0030811). Therefore, these rejections have been withdrawn.

It is noted that original claim 6 was dependent on claim 2. As applicant has only included into claim 1 the limitations of claim 6 and not claim 2, this is considered a new broader claim than the original claim 6. Therefore, the previous rejections have been changed and new rejections have been added accordingly. It is also noted that claim 7 now depends on a cancelled claim, so its allowability is being withdrawn, and a new rejection under 35 U.S.C. 112 is given below.

Applicant's arguments filed January 12<sup>th</sup>, 2009, in regards to Greivenkamp (USPN 4,575,193) have been fully considered but they are not persuasive. First, it is noted that since the claim is broader in scope than the original claim 6, the arguments are moot as the reference has to be interpreted differently. However, in order to clarify the record, a response to the arguments in light of the amendment is hereby given. Applicant argues that "it is clearly all three elements (16), (18) and (20) that provide spatially separated imaging. Therefore, waveplate 18 cannot be an input retardation element as the examiner claims". This is not persuasive. How Greivenkamp may define the imager is inconsequential. The applicant has defined the imager of claim 1 as a means to divide a received image into two or more spatially separated spectral images. The polarizing beam splitter (20) does indeed image a light into two or more spatially separated images (as can be seen in the figures). The filters on 12 further filter these images so they only have a certain spectral component (red, green or blue). Therefore, by the definition of the claim, the combination of polarizing beam splitter 20 and the filters on 12 meet the definition of an imager. Further, the applicant defined the imager as comprising at least one polarizing beam splitter. As Greivenkamp discloses element 20 as being a polarizing beam splitter, this element meets the limitation,

as written by the applicant, of what an imager comprises. Since elements 20 and filters on 12 can meet the limitation of an imager as defined by the applicant within the claim, the element 18 can indeed be interpreted as an input optical retardation element to define the input polarization state of the image received by the imager. Therefore, since Greivenkamp meets all the limitations of the claims, this rejection has been maintained.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 depends on a cancelled claim, therefore it is indefinite and unclear what applicant is trying to claim. Correction is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 4-5, 9-14 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Greivenkamp (USPN 4,575,193), previously cited.

In regards to claims 1 and 20, Greivenkamp discloses an imaging spectrometer (figs. 1, 2a and 7a) comprising; an imager for dividing a received image into two or more spatially separated spectral images (filters on 12 and 20 or 54; as discussed above), detector apparatus for detecting each spectral image (12), an input optical retardation element to define the input polarization state of the image

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received by the imager (18 or 56) wherein the imager comprises at least one polarizing beam splitter (20 or 54).

In regards to claim 2, the imager comprises an image replicator to produce two or more spatially separated images (20), and one or more filter elements (on 12) which act to alter the spectral characteristics of one or more of the spatially separated images (column 3, lines 55-61).

In regards to claim 4, the filter elements are located in the vicinity of said detector apparatus or a conjugate plane thereof (column 3, lines 54-61).

In regards to claim 5, the image replicator comprises two or more polarizing beam splitters (52 and 54) and additionally comprising optical retardation elements (58) located between the polarizing beam splitters (as can be seen in fig. 7a).

In regards to claim 9, the imager comprises one or more spectral replicators arranged in optical series (fig. 7a), each spectral replicator comprising an optical retardation element (58) and a polarizing beam splitter (52).

In regards to claim 10, one or more of the optical retardation elements provides a wavelength dependent polarization change (column 4, lines 27-35).

In regards to claim 11, the thickness of the one or more optical retardation elements is chosen to define the spectral properties of each spectral image (column 5, lines 32-49).

In regards to claim 12, four or more spatially separated spectral images are produced (as can be seen in figs. 2b and 7b).

In regards to claim 13, each spectral image is composed of radiation within a different waveband (in this case, red, green and blue).

In regards to claim 14, the detector apparatus comprises a detector array, each replicated image being directed to a separate portion of the detector array (column 3, lines 51-56).

Claims 1, 9, 17-18 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Padgett et al. (USPN 5,781,293), newly cited.

In regards to claims 1 and 20, Padgett discloses an imaging spectrometer (column 1, lines 5-7) comprising; an imager for dividing a received image into two or more spatially separated spectral images (fig. 6), detector apparatus for detecting each spectral image (30), an input optical retardation element to define the input polarization state of the image received by the imager (24 and column 3, lines 31-38) wherein the imager comprises at least one polarizing beam splitter (32).

In regards to claim 9, the imager comprises one or more spectra replicators arranged in optical series, each spectral replicator comprising an optical retardation element (36) and a polarizing beam splitter (34).

In regards to claim 17, the polarizing beam splitter is a Wollaston prism (column 3, lines 54-55).

In regards to claim 18, the optical components of the imager are formed as a single compound optical element (as can be seen in fig. 6).

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner

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to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3, 15-16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Greivenkamp (USPN 4,575,193), previously cited, in view of well known practices in the art.

In regards to claim 3, Greivenkamp discloses an imaging spectrometer, as discussed above. Greivenkamp is silent to the filter elements being dichroic filter elements. However, which type of filter is used is merely a design choice, and furthermore, the examiner takes Official Notice that dichroic filter elements have the benefit of reflecting unwanted light instead of absorbing it, and therefore do not get as hot as some other filters. Therefore, it would have been obvious to one of ordinary skill at the time the invention was made to replace the filter elements of Greivenkamp with dichroic filter elements, as a matter of design choice, and in order to keep the filters cool due to design, which would be beneficial since the filter's of Greivenkamp are overlaying the detector array.

In regards to claim 15-16, Greivenkamp discloses an imaging spectrometer, as discussed above. Greivenkamp is silent to the detector comprising two or more detector arrays wherein each detector detects a separate replicator image. However, it is disclosed that the detector of Greivenkamp is an image array such as a CCD array (column 3, lines 51-58), wherein each column of the CCD array comprises a single color filter to image a separate replicator image. The examiner takes Official Notice that it is well known in the art to replace a 3 dimensional CCD array, as disclosed by Greivenkamp, with a plurality of linear array detectors (which in this case would lie along the columns of the CCD array). The benefit of doing this is that each linear array can be driven separately, and therefore, can detect and be controlled separately, which allows in more flexibility in the measurement, and also allows lines of detectors to be read before they get saturated, while still allowing other lines to continue measuring. Therefore, it would have been obvious to one of ordinary skill at the time the invention was made to replace the 3 dimensional CCD array of Greivenkamp with a plurality of linear arrays, each placed along where the

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columns of the CCD were, and therefore each measuring a separate replicator image, in order to allow more flexibility with the measurement as well as allowing some lines to be read before others so that they do not become saturated.

In regards to claim 19, Greivenkamp discloses an imaging spectrometer, as discussed above. Greivenkamp is silent to the imaging spectrometer comprising a field stop. However, the Examiner takes Official Notice, that field stops are very well known to be used in measurement devices. Specifically, a measurement device is usually contained within a housing, and a field stop is used to allow only light at a specific area of interest to enter the measurement device, so that no ambient or noise light will reduce the precision of the measurement. Therefore, it would have been obvious to one of ordinary skill at the time the invention was made to include into Greivenkamp's imaging spectrometer, a field stop in order to allow only light at a specific area of interest to enter the measurement device, so that no ambient or noise light will reduce the precision of the measurement.

#### *Allowable Subject Matter*

Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims for the reasons set forth in the previous Office Action (paper number 20080724).

#### *Conclusion*

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH



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shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kara E Geisel whose telephone number is **571 272 2416**. The examiner can normally be reached on Monday through Friday, 8am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on **571 272 2800 ext. 77**. The fax phone number for the organization where this application or proceeding is assigned is **571 273 8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

**/Kara E Geisel/  
Primary Examiner,  
Art Unit 2877**

April 2, 2009